Al-Kitab Journal for Pure Sciences (2023); 7(1):83-99.

https://doi.org/10.32441/kjps.07.01.p8

Al-Kitab Journal for Pure Sciences
ISSN: 2617-1260 (print), 2617-8141(online)
www.kjps.isnra.org

Review Study: Blockchain Application in Payroll System

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Citation: Ahmed MM, Shakir AC. Review Study: Blockchain Application in Payroll System. Al-Kitab J. Pure Sci. [Internet]. 2023 Aug. 20 [cited 2023 Aug. 20];7(1):83-99. Available from: https://isnra.net/index.php/kjps/article/view/928 DOI: https://doi.org/10.32441/kjps.07.01.p8.

Keywords: Blockchain, ECC, Payrol Merkel tree, Hash, HR.

Article History

Received	29 May	2023
Accepted	15 July	2023
Available online	20 Aug.	2023

Abstract:

In this era, where business execution is primarily reliant on information, the sooner and more precisely it is received, the better. Blockchain is great for information sharing because it provides instant, shareable, and entirely transparent data kept in an immutable ledger that only network users with permission may access. On the blockchain network, virtually any asset may be recorded and exchanged, reducing risk and expense for all parties involved. This research focuses on blockchain payroll implementation. It is critical to employ the proper tactics to preserve and improve payroll, as blockchain technology is critical for securing the payroll system because it can move both value and information. This review paper's main point is that blockchain technology can be used to reduce overhead and administrative burden, reduce tax spending, and promote openness and accountability in a variety of situations. Blockchain challenges to the payroll system and implementation issues have been highlighted. Given the quantity and complexity of blockchain issues, many of the most significant blockchain roadblocks are characteristic of any new technology's growing pains. The benefits and challenges of using blockchain technology in payroll procedures were discussed after the study. It was determined that doing so would make all employee

records and employer payments matching instantly available at the minute level to various governmental organizations. At a fraction of the cost of current payroll compliance utilizing a fiat cryptocurrency, a blockchain payroll application will provide quick payroll compliance. A blockchain framework that is approved for use with payroll systems and is encrypted using the high-efficiency encryption algorithm to ensure its high security will need to be designed and evaluated.

Keywords: Blockchain, ECC, Payroll, Merkel tree, Hash, HR.

مراجعة البحوث والأدبيات: تطبيق البلوكشين في نظام الرواتب

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في هذا العصر الذي يعتمد تنفيذ الأعمال في المقام الأول على المعلومات، كلما استقبلت المعلومات بشكل أسرع وأكثر دقة، كان ذلك أفضل. يعتبر البلوكشين تقنية لمشاركة المعلومات لأنها توفر بيانات فورية وقابلة للمشاركة وذات شفافية يتم الاحتفاظ بها في دفتر الأستاذ غير القابل للتغيير والذي لا يمكن الوصول إليه إلا لمستخدمي الشبكة الذين لديهم إذن الوصول. تسجل الأصول القيمة والمعلومات على شبكة البلوكشين ويمكن تبادله ، مما يقلل المخاطر والنفقات لجميع الأطراف المعنية. يركز هذا البحث على عمل كشوف أنظمة الرواتب المستخدمة للبلوكشين، حيث من الأهمية استخدام التكتيكات المناسبة للحفاظ على كشوف المرتبات وتحسينها، حيث إن تقنية البلوكشين ضرورية لتأمين نظام كشوف الرواتب لأنها يمكن أن تنقل القيمة والمعلومة. النقطة الرئيسية لورقة المراجعة هذه هي أنه يمكن استخدام تقنية البلوكشين لتقليل النفقات العامة والأعباء الإدارية، وتقليل الإنفاق الضريبي، وتعزيز التوسع بالتقنية في مجموعة متنوعة من المواقف. تم تسليط الضوء على تحديات أنظمة الرواتب المستخدمة للبلوكشين وقضايا التنفيذ. بالنظر إلى كمية وتعقيد مشكلات البلوكشين، تمت مناقشة فوائد وتحديات استخدام تقنية البلوكشين في إجراءات الرواتب بعد الدراسة. تقرر أن القيام بذلك سيجعل جميع سجلات الموظفين ومطابقة مدفوعات الرواتب متاحة على الفور لمختلف المنظمات الحكومية بأقل تكلفة باستخدام عملات مشفرة ، سيوفر أنظمة كشوف الرواتب المستخدمة للبلوكشين امتثالًا سريعًا لكشوف المرتبات. يجب تصميم وتقييم إطار عمل البلوكشين المعتمد للاستخدام مع أنظمة كشوف المرتبات والذي تم تشفيره باستخدام خوارزمية تشفير قوية الكفاءة لضمان أمانها العالي.

الكلمات المفتاحية: بلوكشين، طريقة تشفير **ECC**، شجرة ميركل، طريقة الهاش الترميزية، **HR**.

1. Introduction:

A blockchain is a distributed system composed of growing collections of information known as blocks that are securely linked using cryptography [1]. Each block additionally carries a timestamp and the previous block's cryptographic hash. Although blockchain records are not immutable, they are secure by design and represent a distributed computational system with a high degree of fault tolerance. **Figure 1** below depicts how a blockchain works[2].

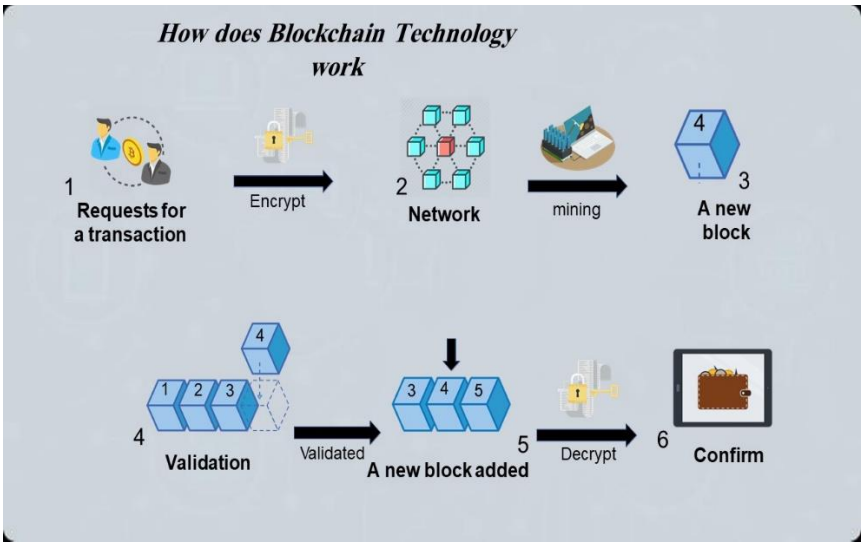

Figure 1. How blockchain works[3]

It necessitates the processing of massive amounts of personal data about employees, such as names, addresses, bank account information, Social Security numbers, and payroll information. All this private information needs to be protected from theft, loss, snooping eyes, hackers, and denial of service attacks. Given that it involves processing personal data, payroll is one of the important human resources areas that blockchain data protection regulations have an impact on. As a result, appropriate technologies must be employed to safeguard and positively affect payroll. Blockchain is a fundamental technology for protecting the payroll system that will herald in the second phase of the Internet, one in which value may be traded as opposed to only information. The General Data Protection Regulation requires the implementation of organizational and technical protections to protect personal data [4]. These metrics could include, for example, the following:

- Workstations, servers, and storage areas must be kept secure.
- Encryption protocols should be established to secure data in transit and at rest.
- Specific security policies should be developed and implemented to protect confidential data.

- Confidentiality requirements must be established to develop best practices for data protection.

  Payroll management software may have features (such as password protection, access control, secure storage, and so on) that are by certain sections of General Data Protection Regulation (GDPR) security regulations.

  Protect private payroll information; A risk assessment can help in identifying whether users, procedures, and systems put private payroll information in danger. Once possible risks have been identified, internal controls and policies can be put in place to mitigate them. Blockchain adoption will make employee payments and all associated deductions and deposits in real-time using a payroll application on the distributed ledger of the blockchain. All employee records and employer-matching payments will be immediately accessible at the audit level to different government entities. A payroll application on the blockchain will enable immediate worldwide payroll compliance at a fraction of the cost of existing payroll compliance using a fiat cryptocurrency [5].

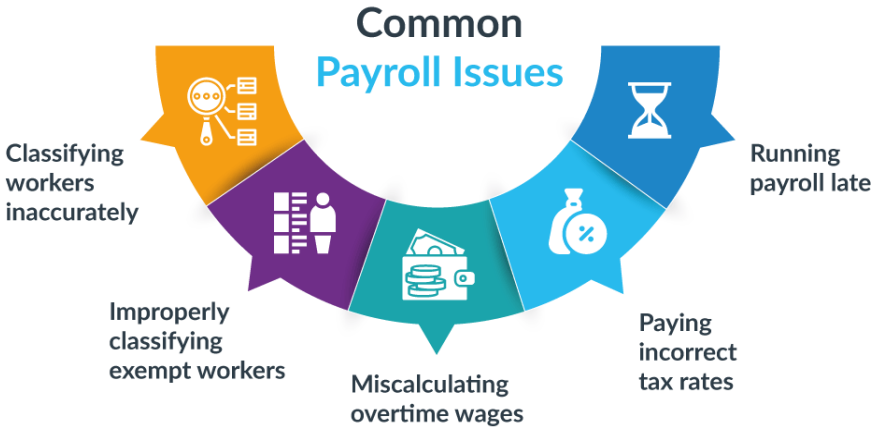

Figure 2. Risk Assessment of Payroll System[6]

2. Previous Studies

1. Bello, Musa Ibrahim, et al. were interested in Blockchain technology to reduce fraud and improve payroll system efficiency. They observed that payroll systems in poor nations suffer issues such as a lack of decentralization, phantom workers, cybercrime, and other manipulations by various groups of individuals. The difficulties of developing-country salary systems have been investigated, as well as how blockchain capabilities might be used to fix them [7]. Given the results, no proposed solution was presented to improve the efficiency of the salary system, and the matter was limited to a general proposal for

blockchain technology. This study proposed an encryption technology with a data ingestion method to protect and improve data. system efficiency.

2. Helliar et al. investigate the prevalence of both unauthorized and authorized blockchain technology in organizations. This study surveyed 67 businesses and discovered that unlicensed blockchains were less likely to be adopted due to security, scalability, and regulatory compliance concerns. Permissioned blockchains, on the other hand, were seen as more appealing due to their greater access control, lower risk of attack, and ability to integrate with existing systems. The authors do, however, point out that the level of control over licensed blockchains can limit their potential for innovation and growth. Overall, the study suggests that organizations carefully weigh the benefits and drawbacks of various types of blockchain before deciding on adoption **[8]**.
3. R. T. Ainsworth and V. Viitasaari were interested in payroll tax and blockchain technology. As financial transactions have a natural affinity with the blockchain, they positioned the development of blockchain as a technology found in the payroll path and anticipated the enormous efficiencies of the technology in reducing the cost of taxes and payments in traditional payroll services during the development of this application. The financial sector is firmly headed in this way. The experts also talked about the several obstacles that now stand in the way of applying technology around payroll, the most significant of which are: what will it take to get the blockchain up and running; regulatory compliance; and whether will businesses be able to use the blockchain. And how will you raise awareness across organizations so that everyone can see the advantages of it? Some locations might only need to upgrade to the most recent technology, depending on where it is typical to create value through technology. The second is that several legacy systems need to be migrated, and adopting blockchain technology will cost time and money **[9]**. They concluded that it would not be difficult to locate businesses willing to move their payroll to the blockchain. Of course, smaller IT firms will probably want to test the new technology on their payroll systems first. The issue was that no practical application of the study that was intended to address the issues with wage systems was offered. Restricted to field studies for other studies without putting out fresh concepts or methods.
4. P. M. Madhani Focus on Blockchain research in the industrial sphere and the key benefits of being of interest to firms, researchers, and practitioners alike. Conclude Blockchain technology can aid in the simplification of work operations and the resolution of numerous process challenges. The report outlines many blockchain qualities and derived benefits that can be used as building blocks for HR managers in various businesses to utilize blockchain

solutions [10]. The report detailed the following benefits of using blockchain in HR in several industries:

- It aids in the improvement of several HR operations.

The blockchain allows HR managers to focus more on strategic HR duties while reducing time, cost, and administrative work, allowing them to improve overall process efficiency and effectiveness.

- Blockchain deployment allows HR managers to spend more time on other strategies by more successfully managing some essential resource procedures.
- Blockchain technology improves the performance of human resources in firms where process automation is allowed by the smart contract system.
- The blockchain's state of development, prioritizing and choosing a particular human resource procedure.
- Blockchain use in the HR sector is being hampered by organizations and change resistance.

There was a discussion of the challenges facing technology applications. Human resources' ignorance of the workings of blockchain technology as well as its functions:

- Blockchain developers and the lack of qualified resources to manage it.
- The inflexibility of IQ contracts is another barrier because it could result in unfavorable outcomes (lack of accountability) in unanticipated circumstances (ie, scenarios that are not accounted for in computer codes).

The highest administrative support, organizational technological readiness, employee motivation, and training of HR specialists in blockchain adoption are the major forces behind a successful blockchain application in HR [11]. Because of the results, it was confusing for the blockchain system and devoid of a coherent conclusion for the application of the system in human resource management, and the contributions were modest without proposing and implementing new blockchain technologies.

5. H. Demirhan Discuss the efficiency of the tax collection system and how to collect taxes at the lowest possible cost. It is critical to ensure the effectiveness of the tax collection system by providing clear, controllable, secure, and real-time information. Changes and advancements in information and communication technology have driven the government to seek innovative methods of revenue collection. Where debates have focused on the application of blockchain technology (or, more colloquially, cryptocurrencies) to the public sector, as well as the application of blockchain technology in a tax system. In terms of data and transparency, the qualities, and benefits of several blockchain systems were examined.

It was determined that blockchain technology can be used in a variety of contexts to lessen the overhead expenses and administrative burden of tax collecting. Therefore, the researcher attempted to explain how blockchain technology could be used concerning taxation. Some

points were made, including how blockchain technology represents a new approach to taxation, how it decreases tax spending, how it increases transparency and accountability, how it can be used to reduce tax evasion, and how it can lighten the administrative burden of collecting taxes[12]. In this study, the characteristics, and benefits of many blockchain systems were examined and it was found that they have a benefit for the tax system, but there was no direct contribution or testing of this system. It aims to add the contribution related to the actual application of the cryptocurrency system with an encryption algorithm to obtain tangible results that support the hypotheses.

6. D. Hanggoro, et al. They talked about data storage and how it may provide privacy, security, and data integrity to keep sensitive data healthy. The researchers planned to create a blockchain application to store employee attendance data from the company's human resources department. The results of the installation reveal that the blockchain may be utilized functionally as a data storage system for attendance management and payroll systems. Furthermore, a new blockchain called Hyperledger Composer has been proposed, which has a rapid validation time and a representational state transfer API (REST API) called composer-rest-server that allows the Hyperledger blockchain to connect with other components **[13]**. Block transaction times are used to assess Hyperledger Composer's performance. The blockchain was assessed in three ways:

   1. Directly inside Hyperledger Composer.
   2. Using Angular web application through REST API.
   3. Using JMeter through the REST API.

   Consequently, testing for constructing transaction blocks varies from 1 to 17 milliseconds in a live experience in Hyperledger Composer, from 5 to 296 milliseconds when using JMeter tools with the REST API, and from 1 - 4270 milliseconds when using the Angular Web Application. The outcome demonstrates that the composer-rest-REST server's API performs better than Ethereum in terms of clock speed. Given the typical transaction time, it was found through these results that the composer-rest-server can manage systems that need quick transaction times, like voting systems, health monitoring, and Internet of Things (IoT) applications. It has been concluded from this study that there are techniques and a practical application used that show the success of the blockchain system in managing the payroll system, but there was no contribution in the aspect of protection and data security, as no algorithm was proposed to protect and encrypt the data. The aim is to propose an encryption algorithm such as ECC to ensure high security in the payroll system.

7. Huaqun Wang, et al. are interested in the secure storage of remote data by cloud computing, to verify the integrity of the data remotely. A special model based on a proven secure blockchain and relying on RSA encryption technology is proposed. At the same time, the system performance is analyzed in two parts: Analysis of theory and model implementation. The results show that the proposed PDP scheme is safe, effective, and practical. The conclusion from this study is good in the field of building a system based on blockchain technology to store and protect data. The weakness of this study lies in the use of the RSA algorithm to protect data, as its encryption is weak and takes a long time due to the use of two keys for encryption and decryption. The authors demonstrated that their scheme can effectively protect the privacy and integrity of outsourced data while maintaining high efficiency **[14]**.
8. Chen, Lanxiang, et al. in this article stated, electronic health records (EHRs) have data leaks that jeopardize patient privacy (eg health conditions). Since the EHR data often doesn't change after being uploaded to the system, the blockchain can be utilized to make it easier to share this data. A searchable, blockchain-based encryption scheme for electronic health records has been made. The results showed that the proposed technology ensures the integrity, anti-tampering, and traceability of the electronic health record index. Because of the conclusions, we find that there is a lack in the process of securing data content and weak encryption methods that are not based on advanced protection algorithms. Protecting data content is not only preventing access to it. The content must be encrypted to prevent unauthorized persons who have succeeded in accessing the data from reading its content. The study concluded that blockchain-based searchable encryption is a promising approach for improving the security and privacy of EHR sharing, and the proposed scheme offers good performance and scalability for practical applications **[15]**.
9. Owoh, N.P., and M.M. Singh, the Proposed study was concerned with the implementation of the blockchain on a large scale. It proposed securing. Sensitive sensor data in a mobile (client/server) blockchain. To this end, an integrated mobile blockchain framework has been proposed that guarantees the master agreement between clients and edge nodes. For efficient encryption of the sensor data, the Diffie-Hellman algorithm was used. Finally, the processes in the framework were analyzed and the results showed that the key pairing between the blockchain client and the edge node is a good process and the data encoded in the framework file is secure as the attacker cannot gain privacy **[16]**. The conclusion from this study is that mobile applications with blockchain did not give convenient and strong connections due to

edge nodes (mining). In addition, the encryption process is heavy and not fast and requires a small key level to obtain the maximum level of security using a shared secret.

10. [17] Feng, Qi, et al. suggested protecting cryptocurrencies and discovered that key protection alone is not sufficient in protecting currencies, and to avoid hacking, a fraudulent key or key theft was used. It has been focused on the Edwards-curve Digital Security Algorithm (EdDSA), which contains many technologies that have been implemented in many cryptocurrencies (such as Cardano, Zcash, and Decred) and designed EdDSA's first effective two-party signature protocol. The security of the proposed protocol is mathematically proven. Results from a performance evaluation of the protocol show that it performs well for the Ed25519 curve, with a single signature operation in the malicious setup taking about 3.32ms between two devices. It was concluded that there are more processes and devices to work using the multiplier EdDSA's proposed protocol incurs fairly large computational and communication costs. Therefore, one possibility is to design an optimized version that is compatible with many devices. The contribution of this study lies in the development of a practical and secure two-party EdDSA signature scheme with key protection, which can enhance the security of cryptocurrency systems and other applications that use EdDSA signatures.
11. Liang, Yifei, and others concluded that a blockchain-based DSA test platform should be built for spectrum management. They state that deploying blockchain in future networks has the advantage of addressing problems exposed in traditional centralized spectrum management systems, such as high-security risks and low allocation efficiency. It was found that the blockchain-based spectrum reference architecture can be employed in the next generation of mobile communications, 6G **[18]**. The problems of this research are related to testing the proposed mechanisms and system evaluation for each form in various 5G and/or 6G mobile communications. A series of mechanisms need to be developed to support the proposed blockchain-based spectrum management architecture, which includes a capacity generation mechanism, an incentive mechanism, and a pricing mechanism, among many others.

3. Discussion

As previously stated, Blockchain technology can boost the effectiveness of payroll systems, which is a critical operation for every government, industry, and other organization because it ensures it.

Employees should be paid on time and accurately. Furthermore, payroll systems face challenges from decentralized Blockchain technology, ghost workers, cybercrime, and other human manipulations. Depending on **Table 1** the blockchain's capabilities can be used to overcome problems with payroll systems in developing countries. The proof of authority for the encryption algorithm used was the best study result also, the security requirement was the most logical and successful in security applications in terms of verification and scalability as well as audibility, privacy, and Anonymity. The remainder of the paper demonstrates how blockchain technologies are a promising approach to minimizing payroll system issues. the challenges It was explained by an examination of the current literature. The significance of blockchain technology in general, as well as its application in payroll, has been explained.

In **Table 1** Requirement for Studies has been mentioned. From the Security requirement field, some criteria were used to measure the efficiency and safety of the system in the studies presented.

- Verifiable has an Information Security Program in place to secure the confidentiality, integrity, and availability of information assets while also meeting regulatory, industrial, and contractual obligations **[19]**.
- Security Compliance is a process that an organization undergoes to ensure that it complies with the set standards and regulations **[20]**.
- System Capability is the ability of a system to execute a particular course of action or achieve a desired effect, under a specified set of conditions **[21]**.
- Expense Management and Processing ensures that every expense claim is accounted for and reimbursed as quickly as possible while keeping tabs on all activities **[22]**.
- Payroll Tax Management software mitigates the organization's and payroll system's responsibilities for payroll tax rates **[23]**.
- Scalable security is a security approach and toolset that may grow or decrease capacity to handle a greater or smaller load, based on demand changes **[24]**.
- Completeness is to ensure that a comprehensive set of requirements has been produced and documented that describes all security system functions required to meet needs, as well as their associated performance, environmental, and other non-functional requirements **[25]**.
- Privacy is the right to decide how information is viewed and utilized, and it includes skills like using tools and managing information shared online **[26]**.
- Eligibility is a determination that a system is able and willing to safeguard classified security information. The three security clearance eligibility levels are: Confidential, Secret, and Top Secret **[27]**.

Table 1. Blockchain Requirement for Studies

References	Schema name	Publication year	Blockchain Type	Framework	Encryption algorithm used	Security requirement								
						Eligibility	Security and Compliance	Privacy	Completeness	System Capabilities	Payroll and Tax Management	Expense Management and Processing	Scalability	Verifiability
[7]	Potentials of Blockchain Technology for Payroll Systems	2022	Private	Hyperledger	Symmetric key crypto	√	√	√	x	√	√	√	x	√
[8]	Permissionless and permissioned blockchain diffusion	2020	Private	Ethereum	cryptocurrency	√	√	x	x	√	√	√	x	x
[9]	Payroll tax & the blockchain	2017	Private	Ethereum	cryptocurrency	x	√	√	x	√	√	√	x	√
[10]	Blockchain Applications in HR: Key Advantages	2022	Public	Hyperledger	Symmetric key crypto	√	√	√	x	√	√	√	x	√
[11]	Role of Blockchain in HR's Response to new-normal	2021	Private	Hyperledger	Proof of Authority	√	√	√	x	√	√	√	√	√
[12]	Effective taxation system by blockchain technology	2019	Public	Hyperledger	Symmetric key crypto	x	√	√	x	√	√	√	x	√
[13]	Blockchain-based Attendance Management and Payroll System using Hyperledger Composer Framework	2022	Private	Hyperledger	Proof of Authority	√	√	√	√	x	√	√	x	√
[14]	Blockchain-based private provable data possession	2019	Private	Hyperledger	RSA	x	√	√	x	√	√	√	x	√
[15]	Blockchain-based searchable encryption for electronic health record sharing	2019	Private	Ethereum	Symmetric key crypto	x	√	√	x	x	√	√	√	√
[16]	Applying the Diffie-Hellman algorithm to solve the key agreement problem in mobile blockchain-based sensing applications	2019	Public & Private	Ethereum	Diffie-Hellman	x	√	√	x	√	x	√	x	√
[17]	Practical Secure Two-Party EdDSA Signature Generation with Key Protection and Applications in Cryptocurrency	2020	Public & Private	Hyperledger	EdDSA	√	√	√	x	√	√	√	x	√
[18]	Interference-based consensus and transaction validation mechanisms for blockchain-based spectrum management	2021	Private	Ethereum	Asymmetric key crypto	x	√	√	x	√	√	√	x	√

4. Challenges of Blockchain for Payroll System

Relying on previous studies and conclusions, the major challenges of blockchain technology were diagnosed as mentioned below:

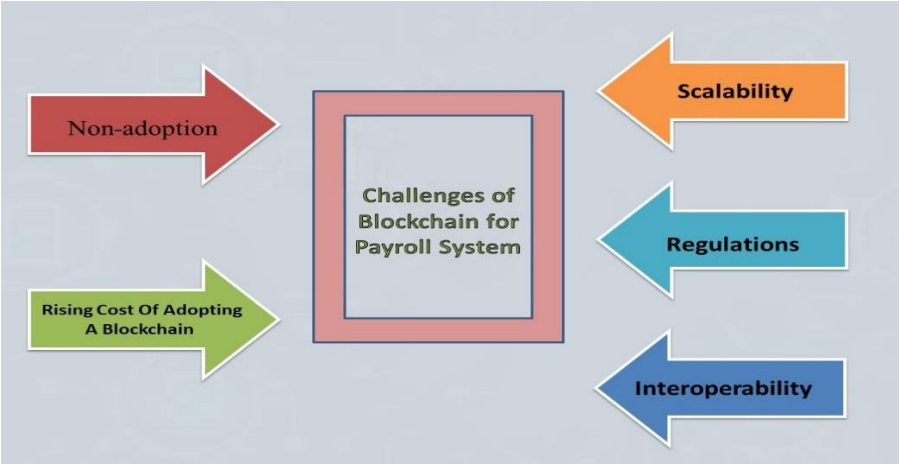

Figure 3. Blockchain challenges[28].

- **Non-adoption**

When used by a large user base, blockchains operate more effectively and efficiently. For instance, the blockchain ecosystem will need suppliers as well as users to sign up for the network. However, according to researchers, only 29% of businesses are actively experimenting with or utilizing the blockchain. Blockchains will remain inefficient and scalable without mass usage **[29]**.

- **The rising cost of adopting a blockchain**

It all comes down to early financial investments. Implementation costs can be prohibitively expensive for some businesses. Even though most existing solutions are free, significant expenditure is required when hiring qualified software engineers that specialize in blockchain development, license fees if moving to a downloadable software version, thorough maintenance, and other costs. It is one of the most significant obstacles to blockchain implementation **[30]**.

- **Scalability**

The key challenge in implementing it is scalability. Although transaction networks can handle hundreds of transactions per second without fail, transaction processing slows significantly when it comes to Bitcoin (approximately 3-7 transactions per second) and Ethereum (about 15-20 transactions), making the blockchain not widely useful. applications of scope

- **Regulations**

The next area that may encounter challenges is a lack of regulation. Scams and market manipulation that could lead to a worldwide economic collapse are not unthinkable. As a result, Bitcoin has received a great deal of unfavorable attention from people all around the world. Some nations have explicitly outlawed Bitcoin, while others have attempted, with limited success, to regulate blockchain networks [31].

- **Interoperability**

One of the key problems that needs to be solved is interoperability, as this is one of the main reasons why businesses have been slow to adopt blockchain technology. Due to its inability to send and receive data from other blockchain-based systems, the majority of the blockchain is kept in isolation and does not interact with peer networks [32].

Other difficulties are caused by the absence of a universal standard. The lack of a global standard led to interoperability issues that increased costs and complicated procedures. The lack of a specific version of blockchain technology discourages new investors and developers from entering the market.

Given the number and complexity of these blockchain issues, though, many of the blockchain's biggest hurdles reflect the typical growth pains with any new technology. We conclude that the above-mentioned difficulties give the need for technological improvements, as evidenced by the list of challenges of Blockchain adoption. Also, payroll systems are busy dealing with it. Things will undoubtedly become more interesting if they are fixed and the many bottlenecks that currently prevent widespread adoption can be narrowed down and can be used in different storage areas as these problems do not affect the business fundamentally.

5. Blockchain Benefits in Payroll Processes

In a decentralized system, blockchain transaction ledgers may be easily tracked. It contributes to a more transparent and indisputable transaction history. The employee payroll management system must adhere to numerous rules, and blockchain will aid in reducing inconsistencies and saving time for the HR department.

Payroll management software today aids in the tracking of time, attendance, benefits, payroll, fraud prevention, and schedule management. Business HR leaders are investigating the use of blockchain in the aforementioned processes to streamline and power them [33].

The use of blockchain technology will improve the payment procedure for contract workers. Organizations, institutions, and universities will have a workforce that functions on a contract basis in addition to full-time personnel. Because the bills must be verified, these contract workers must wait longer to be paid. Companies that use blockchain payroll processing software may automate the verification process and pay contract workers as soon as the work is performed **[34]**.

Blockchain will offer precise time and attendance information. Blockchain technology protects the accuracy of the employee database and prevents tampering with it. This means that payroll software with blockchain for small enterprises, schools, and colleges will ensure that the time, attendance, and departure data recorded by the system is true and that no one has tampered with the database **[35]**.

Businesses and governmental entities will be able to use cryptocurrency for payment. Decentralization is the best feature of cryptocurrencies, so it will be advantageous for many reasons if the payroll processing software pays the employee in cryptocurrencies. The first step will be the adoption of uniform remuneration for the whole workforce, which will end global inequity. Many governments throughout the world either do not accept or outright forbid cryptocurrencies. These nations must pay in local currency because using cryptocurrency is not an option for them. Blockchain-enabled payroll software will guarantee the accuracy, speed, and transparency of payroll processes **[36]**.

We determined that incorporating blockchain into payroll software will completely transform the labor and payment processes. Blockchain can transform many facets of human resources and payroll operations.

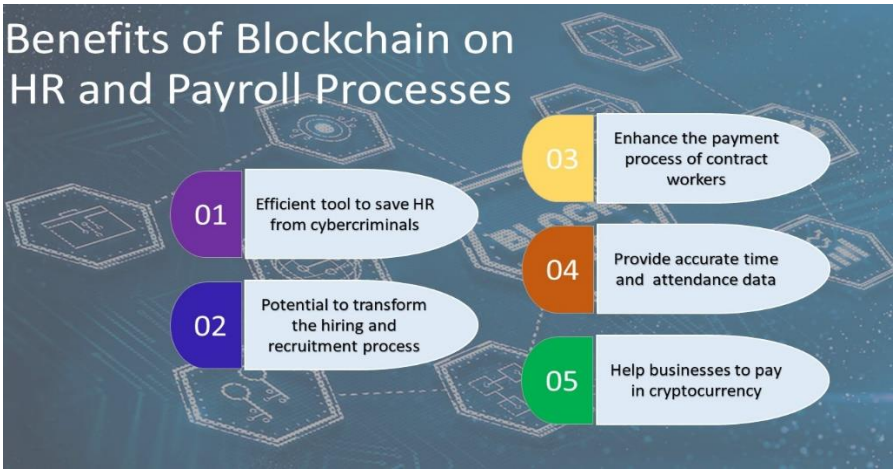

Figure 4. Blockchain Benefits on Payroll System[37].

6. Conclusion

It was concluded that the blockchain is solution-driven in the issues of the payroll system and in managing the business efficiently and effectively. It is a technology that has the ability and capabilities to solve problems related to payroll systems.

Such as centralization, data manipulation and inconsistency, cybercrime, phantom workers, and seamless auditing. An authorized blockchain will establish decentralization, data integrity, data availability, transparency, and space for data auditing. In this paper, we have outlined the capabilities and capabilities of the blockchain and how it can fit into solving salary issues as well as challenges in applying the technology. It was concluded that the application of blockchain technology to the payroll system will make all records of employees and matching payments of employers immediately available at the audit level to various government agencies. Implementing payroll on the blockchain will enable instant payroll compliance around the world at a fraction of the cost of current payroll compliance using a fiat cryptocurrency.

Future research is required to design and evaluate a blockchain framework that is authorized for payroll systems and is encrypted by the high-efficiency block encryption algorithm to ensure their high security.

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